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## THE LIVERPOOL MATHEMATICAL SOCIETY.

(LIVERPOOL BRANCH OF THE MATHEMATICAL ASSOCIATION.)

*Report for the Session 1949-50.*

*Officers.*—President, Mr. E. D. Camier; Vice-President, Miss J. S. Batty; Secretary, Mr. J. Kershaw; Treasurer, Mr. L. Sowerby; Auditor, Miss W. Taylor; Committee : Mr. W. F. Bushell, Mr. S. D. Daymond, Dr. C. W. Jones, Miss A. E. Leake, Mr. A. T. F. Nice, Miss W. Taylor, (*Ex-officio*) Professor J. M. Whittaker.

*Activities.* The Society held six meetings, all well attended, and each only concluded after vigorous discussion. During the course of the Session we were happy to welcome over 20 new members, the final number on the roll being 95. Once again the Society received a food parcel from the Victoria, Australia, Branch of the Association. We appreciate the generosity and kindness which inspired this gift, and would extend both our thanks and most sincere good wishes to our mathematical friends of the Victoria Branch. The Society's Mathematical Prize for 1949-50 was awarded to Mr. T. Murphy.

### *Abstracts of Lectures.*

17th October, 1949. "How to Doodle"; Dr. J. Bronowski. Dr. Bronowski, having suggested that an analysis of this craft—so widespread in all committees of the present day, was long overdue, classified those doodles made without lifting the pen or retracing lines into various different types. Having obtained the necessary and sufficient conditions for their traceability, the speaker added some extensions to the results obtained in this field by Euler, and showed that certain doodles when dualised led to easy solutions of a number of topological puzzles.

7th November, 1949. "H.S.C. Performances in Arts and in Sciences"; Mr. J. A. Petch, Secretary of the Joint Matriculation Board. The speaker analysed statistically the performances of those 1947 H.S.C. candidates who offered three principal subjects and again offered each the same three subjects in 1948. From this analysis it appeared that not only did the aggregate marks of Science candidates on the first occasion run at a higher level than those offering Arts, but that at the second attempt the advantage of the Science candidates was even more marked.

5th December, 1949. Presidential Address : "Non-Euclidean Geometry"; Mr. E. D. Camier, Birkenhead School. Mr. Camier described the work of Gauss, Bolyai and Lobachevsky, who were the first to realise the independence of Euclid's Parallel Postulate from his other definitions and postulates, and to develop a logically consistent geometry based on a hypothesis contradicting Euclid's. A brief account of the more interesting features of this geometry was followed by a sketch of its later history and its relation to the geometry of physical space.

23rd January, 1950. "Mathematics in the Modern School"; Mrs. E. M. Williams, Principal, City of Leicester Training College. A child's mathematical studies, Mrs. Williams suggested, should be rooted in its own needs, and should lead it from symbolism and formulae to the accurate use of language and a respect for precision and truth. Powers of generalisation and abstraction could be developed, and, most importantly, the power to perceive relationships. The proposed syllabus was illustrated by examples drawn from problems confronting the child in everyday life.

27th February, 1950. "Recent Trends in the School Teaching of Geometry"; Mr. A. Robson. Outlining the content of a typical school mathematical syllabus of the early part of this century, Mr. Robson discussed the defects of Euclid for the feeble pupil, and how the unimportant distinction between pure and analytical methods in conics was laboured whilst the important distinction between metrical and projective methods was neglected. Duality and Salmon's use of abridged notation were left until too late. A number of problems solved by alternative methods were used to support Mr. Robson's thesis.

22nd May, 1950. Annual General Meeting. The election of Officers for the 1950-51 Session and a short business meeting were followed by an address—"Actuarial Mathematics"—given by Mr. G. Heywood, of Messrs. Duncan Fraser & Co., Liverpool. Mr. Heywood first explained the H.M. (Makeham Graduation) Table, and derived an expression for the Annual Premium for a £100 Whole-Life Assurance Policy. More recent Tables were then mentioned, and the speaker detailed much of the procedure used by an actuary when making a valuation for an assurance company.

#### BIRMINGHAM UNIVERSITY MATHEMATICAL ASSOCIATION.

##### REPORT FOR 1950.

DURING the early months of the year numbers attending meetings decreased, but several interesting lectures were enjoyed by those present. "The Theory of Evaporating Stars" and "The Mathematical Theory of Puzzles", both appropriately illustrated, were the most outstanding ones. As in the past few years, staff and student members of the Society met on one occasion to discuss the Honours syllabus, and much was said, with deep feeling, by both sides.

A visit to Cadbury's Works proved interesting and enjoyable. The other works visit arranged for Austin's was unavoidably cancelled.

The only meeting in the summer term was the Annual General Meeting, when new officers and committee were elected and the progress of the Society surveyed in the Secretary's report. Arrangements were made for organised recreational activities during the post-examination weeks in June.

The new session started well in October by having more than 90 staff and students present at the Freshers' Tea. A further welcome was extended to the freshers by a social evening attended by 80 members and friends.

The Presidential Address was traditionally non-mathematical, and gave us an insight to life in foreign universities in pre-war days.

Lectures have also been given on "Football Pools", the "Life and work of Ramanujan" and the "Klumpen Theorie", all of which have proved extremely interesting and often amusing.

A further visit to Cadbury's was arranged for early December on account of the popularity of the former visit.

Attendance at meetings has been somewhat higher than in previous years :

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approximately 70 members and friends have been present for all meetings in the Autumn Term, excepting the one immediately before examination week.

Membership cards have been obtained for the second half of the present session, and it is hoped that this practice will be continued for the whole of future sessions.

So far the Society has over 60 official members from staff and students, and several others regularly attend meetings.

## BOOKS RECEIVED FOR REVIEW.

L Bierberbach. *Einführung in die analytische Geometrie*. 4th edition. Pp. 168. DM. 8.90. 1950. (Verlag für Wissenschaft, Bielefeld)

K. Camp. *The Whittaker-Henderson graduation process*. Pp. 47. \$1. 1950. (Published by the author, New York)

A. Charrueau. *Sur des congruences de droites ou de courbes et sur une transformation de contact liée à ces congruences*. Pp. 72. 500 fr. 1950. Mémorial des sciences mathématiques, 115. (Gauthier-Villars)

R. G. Cooke. *Infinite matrices and sequence spaces*. Pp. xiii, 347. 42s. 1950. (Macmillan)

D. B. Delury. *Values and integrals of the orthogonal polynomials up to n=26*. Pp. 33. 9s. 6d. 1950. (University of Toronto Press; Geoffrey Cumberlege, Oxford University Press)

Ky Fan. *Les fonctions définies-positives et les fonctions complètement monotones*. Pp. 47. 400 fr. 1950. Mémorial des sciences mathématiques, 113. (Gauthier-Villars)

R. A. Fisher. *Contributions to mathematical statistics*. A collection of 43 papers. 60s. 1950. (John Wiley, New York; Chapman and Hall)

C. Fox. *An introduction to the calculus of variations*. Pp. viii, 271. 21s. 1950. (Geoffrey Cumberlege, Oxford University Press)

M. Fréchet. *Généralités sur les probabilités. Éléments aléatoires*. 2nd edition. Pp. xvi, 355. 1950. *Traité du calcul des probabilités*, I, 3, i. (Gauthier-Villars)

M. Fréchet. *Leçons de statistique mathématique*. Cahiers 2, 4. Pp. 52, 168. 1950. (Centre de Documentation Universitaire, Paris)

S. H. Glenister. *Technical drawing for schools*. I, II. Pp. 128 each. 5s. each. 1950. (Harrap)

G. Guinier. *Éléments de physique moderne théorique*. II. Pp. 161-309. 1950. (Bordas, Paris)

K. Jellinek. *Weltystem, Weltäther und die Relativitätstheorie*. Pp. xv, 450. Sw. fr. 45. 1950. (Wepf, Basel)

N. L. Johnson and H. Tetley. *Statistics: an intermediate text-book*. II. Pp. xi, 318. 20s. 1950. (Cambridge University Press)

B. W. Jones. *The arithmetic theory of quadratic forms*. Pp. x, 212. 24s. 1950. Carus mathematical monographs, 10. (Mathematical Association of America; John Wiley, New York; Chapman and Hall)

E. Landau. *Differential and integral calculus*. Translated by M. Hausner and M. Davis. Pp. 366. \$4.50. 1950. (Chelsea Publishing Company, New York)

T. Levi-Civita. *Le problème des n corps en relativité générale*. Pp. 111. 800 fr. 1950. Mémorial des sciences mathématiques, 116. (Gauthier-Villars)

H. V. Lowry and H. A. Hayden. *Advanced mathematics for technical students*. II. Pp. ix, 422. 18s. 1950. (Longmans)

P. E. Machovina. *A manual for the slide rule*. Pp. 78. 6s. 6d. 1950. (McGraw-Hill)

A. E. E. McKenzie. *A second course of mechanics and properties of matter*. Pp. viii, 232. 11s. 6d. 1950. (Cambridge University Press)

N. W. McLachlan et P. Humbert. *Formulaire pour le calcul symbolique*. 2nd edition. Pp. 65. 350 fr. 1950. Mémorial des sciences mathématiques, 100. (Gauthier-Villars)

## THE MATHEMATICAL GAZETTE

✓ N. W. McLachlan, P. Humbert et L. Poli. *Supplément au formulaire pour le calcul symbolique.* Pp. 59. 450 fr. 1950. Mémorial des sciences mathématiques, 113. (Gauthier-Villars)

○ W. Michael. *Ortskurvengeometrie in der komplexen Zahlenebene.* Pp. 93. Sw. fr. 11.50. 1950. (Birkhäuser, Basel)

○ F. Neiss. *Analytische Geometrie.* Pp. viii, 167. DM. 9.60. 1950. (Springer, Berlin)

○ G. Pickert. *Einführung in die höhere Algebra.* Pp. 298. DM. 12.80; geb. DM. 14.80. 1950. Studia Mathematica, 7. (Vandenhoeck und Ruprecht, Göttingen)

✓ B. van der Pol and H. Bremmer. *Operational calculus based on the two-sided Laplace integral.* Pp. xiii, 415. 55s. 1950. (Cambridge University Press)

✓ H. Pollard. *The theory of algebraic numbers.* Pp. xii, 143. 24s. 1950. Carus mathematical monographs, 9. (Mathematical Association of America; John Wiley, New York; Chapman and Hall)

D. Ponton. *The Knowall Maths. I. II.* 7s. 6d.; 10s. 1950. (D. Ponton, 11 Churchfield Road, Poole, Dorset)

A. Porter. *An introduction to servo-mechanisms.* Pp. vi, 154. 7s. 6d. 1950. (Methuen)

✓ W. W. Rogosinski. *Fourier series.* Translated by H. Cohn and F. Steinhardt. Pp. vi, 171. \$2.50. 1950. (Chelsea Publishing Company, New York)

M. Roy. *Mécanique des milieux continus et déformables. I. II.* Pp. xxii, 366; xii, 338. 2800 fr.; 2300 fr. 1950. (Gauthier-Villars)

✓ R. Schatten. *A theory of cross-spaces.* Pp. vi, 153. 16s. 1950. *Annals of Mathematics Studies,* 26. (Princeton University Press; Geoffrey Cumberlege, Oxford University Press)

○ H. Schwerdtfeger. *Introduction to linear algebra and the theory of matrices.* Pp. 280. 15 fl.; cloth 17.50 fl. 1950. (Noordhoff, Groningen)

○ D. Skolnik and M. C. Hartley. *Dynamic plane geometry.* Pp. xii, 289. \$2.56; 18s. 1950. (Van Nostrand, New York; Macmillan)

✓ H. Steinhaus. *Mathematical snapshots.* 2nd edition. Pp. vi, 266. 27s. 6d. 1951. (Geoffrey Cumberlege, Oxford University Press)

K. B. Swaine. *Exercises in elementary mathematics. III.* Pp. 254. 7s. 6d. 1950. (Harrap)

H. Tietze. *Gelöste und ungelöste mathematische Probleme aus alter und neuer Zeit. I. II.* Pp. xx, 256; 305. DM. 18; geb. DM. 25. 1949. (Biederstein, München)

✓ F. Tölke. *Praktische Funktionlehre. I. Elementare und elementare transzendente Funktionen.* 2nd edition. Pp. xi, 440. DM. 39. 1950. (Springer, Berlin)

✓ J. D. Trimmer. *Response of physical systems.* Pp. ix, 268. 40s. 1950. (John Wiley, New York; Chapman and Hall)

P. Wijdenes. *Boldriehoeksmeting.* 10th edition. Pp. 298. 9.50 fl.; bound, 11.50 fl. 1950. (Noordhoff, Groningen)

P. Wijdenes. *Leerboek der goniometrie en trigonometrie.* 7th edition. Pp. 363. 13 fl. bound. 1950. (Noordhoff, Groningen)

✓ Contributions to Fourier series. (A. Zygmund, W. Transue, M. Morse, A. P. Calderon, S. Bochner.) Pp. 188. 20s. 1950. *Annals of Mathematics Studies,* 25. (Princeton University Press; Geoffrey Cumberlege, Oxford University Press)

*Oeuvres mathématiques d'Évariste Galois.* 2nd edition. Suivies d'une notice sur Galois par G. Verriest. Pp. x, 61, 56. 300 fr. 1951. (Gauthier-Villars)

May, 1951

## NEW SOUTH WALES BRANCH

### REPORT FOR 1950.

There are now 464 members of this Branch; the number has steadily grown since the publication of the *Australian Mathematics Teacher*.

During the year the following meetings were held and addresses given:

1. Discussion of mathematical papers set for the L.C.E., 1949.
2. Mr. B. N. Farlow : "Let us face the facts about mathematics in schools." Mr. Farlow's remarks were based upon investigations made in some of the primary as well as some secondary schools in one district of N.S. Wales.

3. Mr. H. H. Thorne : "On the invention of logarithms by Napier of Merchiston."

4. Mr. J. L. Williams : "On the work of the Council of the Mathematical Association."

5. Annual Meeting : reports were received from the Hon. Secretaries, the Hon. Treasurer, the Problems Bureau, the *Gazette* Secretary and the Editorial Committee. For the Presidential Address, delivered at this meeting, the retiring President, Mr. W. B. Smith-White, spoke about "Some functions in the curriculum of school mathematics, and their relationships". Mr. Smith-White spoke about the trigonometrical, exponential and logarithmic functions. A different approach from that usually adopted in schools and in most current texts was advocated; and in particular it was shown how the school course in the calculus could be adapted to throw light on the nature of these functions.

The reports showed that the work of the Branch is proceeding in a satisfactory way. Meetings are usually well attended, and discussion of papers has been stimulating. The financial position is satisfactory; but rising costs demand that great care and watchfulness are exercised in connection with the publication of the Branch's journal. One very encouraging feature about this project is the good support given by teachers outside N.S. Wales, particularly from the other Australian states and New Zealand.

Most of the present office-bearers were re-elected for the year 1951, with the exception that Mr. Smith-White retired from the position of President, and Mr. P. N. Andersen was elected to fill that position. It was also decided to provide for extra secretarial assistance, and Mr. B. N. Farlow was made Publicity Secretary. The Problems Bureau each year has a steady stream of questions presented to it for solution. Many members have expressed themselves as grateful for the assistance they have obtained. The distribution of the *Mathematical Gazette* has proceeded satisfactorily.

The editorial work of the *Australian Mathematics Teacher* necessarily demands considerable thought, and consumes a great deal of time. It has not been possible to publish at once, nor always in full, all the material that has been offered, because of lack of printing space; and until costs are reduced, it will not be possible to increase the size of the journal.

I. D. Barnes }  
H. J. Meldrum } Joint Hon. Secretaries.

## PI MU EPSILON JOURNAL

THE organisation and functions of the fraternities of the universities of the United States are not always well understood in this country. But the aims of the Pi Mu Epsilon fraternity, primarily the advancement of mathematics by the co-operation of responsible and competent scholars enlisted from the senior undergraduates, must be endorsed by all of us. This fraternity was

founded on its present basis by the astronomer E. D. Roe, for many years Professor at Syracuse University, and he envisaged that when it became a national organisation with chapters in the leading universities and colleges of America, there would be a desire and a need for a fraternity journal. Such a journal has now been started, with Professor Ruth W. Stokes of Syracuse as editor, and three numbers have so far appeared. A part of each is naturally devoted to fraternity matters, but there are interesting short articles, problems to be solved, and a feature which is similar to the "Gleanings" of the *Gazette*, the flavour of which may be appreciated by the following example extracted from No. 3 :

$$\left(\frac{1}{2}\right)^3 < \left(\frac{1}{2}\right)^2.$$

Take logarithms to base  $\frac{1}{2}$

$$3 \log_{\frac{1}{2}} \frac{1}{2} < 2 \log_{\frac{1}{2}} \frac{1}{2}.$$

But  $\log_b b = 1$ . Hence  $3 < 2$ .

We wish the new journal every success. Details and subscription rates can be had from H. C. Bennett, 15 Smith Hall, Syracuse University, Syracuse 10, N.Y.

#### MATHEMATICAL PIE

*Mathematical Pie*, the journal emanating from the Gateway School, Leicester, has just issued its second number. The attention of all teachers is directed to this little periodical, price 2d., for it has matter to suit all tastes, and is cheap enough to be within the pockets of many school children. The editor is Mr. R. H. Collins, The Gateway School, Leicester, from whom further particulars can be obtained.

#### LIVERPOOL UNIVERSITY MATHEMATICAL MAGAZINE

THE Mathematical Society of the University of Liverpool, a branch of the Mathematical Association, whose membership is made up of both staff and students, is producing a new periodical, the contents of which are of general scientific interest, with a strong leaning towards mathematics. Both staff and students have contributed to the first number, which will consist of about 20 to 24 pages, price 1s. 6d.

#### BOOKS RECEIVED FOR REVIEW.

P. Appell. *Analyse mathématique. I. II.* 6th edition, completely revised by G. Valiron. Pp. ix, 408; 434. 2000 f.; 2200 fr. 1951. (Gauthier-Villars)

H. Beghin et G. Julia. *Exercices de mécanique. I, II.* 2nd edition. Pp. vii, 337. 1946. (Gauthiers-Villars)

S. Bergman. *The kernel function and conformal mapping.* Pp. vii, 161. \$4. 1950. *Mathematical Surveys*, 5. (American Mathematical Society)

E. E. Biggs and H. E. Vidal. *Mathematics today. I. The world we live in.* Pp. xiii, 322. 6s. 6d. 1951. (Ginn)

L. de Broglie. *Problèmes de propagations guidées des ondes électromagnétiques.* 2nd edition. Pp. 118. 1100 fr. 1951. (Gauthier-Villars)

G. R. Clements and L. T. Wilson. *Analytical and applied mechanics.* 3rd edition. Pp. xi, 463. 47s. 1951. (McGraw-Hill)

M. V. Deshpande. *Model papers in algebra.* Pp. iv, 216. Rs. 3. (High School, Poona, 2)

G. Doetsch. *Handbuch der Laplace-Transformation. I.* Pp. 581. Sw. fr. 74; geb. Sw. fr. 78. 1950. (Birkhäuser, Basel)

A. Duschek. *Vorlesungen über höhere Mathematik. II.* Pp. vi, 386. 44s. 6d.; bound, 49s. 1950. (Springer, Vienna)

## BOOKS RECEIVED FOR REVIEW

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A. G. Ghaffari. *The hodograph method in gas dynamics.* Pp. iv, 129. N.p. 1950. (Taban Press, Tehran)

W. Gröbner und N. Hofreiter. *Integraltafel. II. Bestimmte Integrale.* Pp. vi, 204. 41s. 1950. (Springer, Vienna)

H. Hasse. *Vorlesungen über Zahlentheorie.* Pp. xii, 474. DM 42; geb. DM 45. 1950. Grundlehren der mathematischen Wissenschaften, 59. (Springer, Berlin)

H. Hasse. *Höhere algebra. I. II.* 3rd edition. Pp. 152, 158. DM 2.40 each. 1951. Sammlung Göschens, 931, 932. (Walter de Gruyter, Berlin)

D. Hilbert and W. Ackermann. *Principles of mathematical logic.* Translated by L. M. Hammond, G. G. Leckie and F. Steinhardt. Edited, with notes, by R. E. Luce. Pp. xii, 172. \$3.50. 1950. (Chelsea Co., New York)

C. Jordan. *Calculus of finite differences.* 2nd edition. Pp. xxi, 652. \$5.50. 1950. (Chelsea Co., New York)

A. N. Kolmogorow. *Foundations of the theory of probability.* Translated by N. Morrison. Pp. viii, 71. \$2.50. 1950. (Chelsea Co., New York)

D. König. *Theorie der endlichen und unendlichen graphen* (Rep.). Pp. 258. \$3.95. 1950. (Chelsea Co., New York)

E. Landau. *Foundations of analysis.* Translated by F. Steinhardt. Pp. xiv, 134. \$2.75. 1951. (Chelsea Co., New York)

A. Landé. *Quantum mechanics.* Pp. x, 307. 40s. 1951. (Pitman)

D. E. Littlewood. *A university algebra.* Pp. viii, 292. 21s. 1950. (Heinemann)

A. R. Low. *Normal elliptic functions.* Pp. 30. 9s. 6d. 1950. (Toronto University Press ; Geoffrey Cumberlege, London)

W. Maak. *Fastperiodische Funktionen.* Pp. viii, 240 DM 21.60; geb. DM 24.60. 1950. Grundlehren der mathematischen Wissenschaften, 61. (Springer, Berlin)

W. Magnus and F. Oberhettinger. *Formulas and theorems for the special functions of mathematical physics.* Translated by J. Wermer. Pp. 172. \$3.50. 1949. (Chelsea Co., New York)

A. Page. *Trigonometry.* Pp. viii, 276. 18s. 1951. (University of London Press)

O. Perron. *Irrationalzahlen.* 2nd edition, rep. Pp. viii, 199. \$3.25. 1948. (Chelsea Co., New York)

R. I. Porter. *Further elementary analysis.* Pp. xi, 306. 21s. 1951. (Bell)

G. Y. Rainich. *Mathematics of relativity.* Pp. vii, 173. 28s. 1950. (Wiley, New York ; Chapman & Hall)

B. S. Ray. *Differential calculus.* Pp. ii, 246. Rs. 6/8. 1950. (Das Gupta, Calcutta)

A. C. Schaeffer and D. C. Spencer. *Coefficient regions for schlicht functions.* Pp. xi, 311. \$6. 1950. American Mathematical Society Colloquium Publications, 35. (American Mathematical Society, New York)

A. W. Siddons, K. S. Snell and J. B. Morgan. *A new calculus. I. II.* Pp. 116, 258. 5s., 10s. 6d. 1950. 1951. (Cambridge University Press)

W. M. Smart. *The origin of the earth.* Pp. vi, 239. 12s. 6d. 1951. (Cambridge University Press)

J. F. Steffensen. *Interpolation.* 2nd edition. Pp. ix, 248. \$3.50. 1950. (Chelsea Co., New York)

D. Voelker und G. Doetsch. *Die zweidimensional Laplace-Transformation.* Pp. 259. Sw. fr. 39; geb. Sw. fr. 43. 1950. (Birkhäuser, Basel)

W. Wilson. *The microphysical world.* Pp. vii, 216. 5s. 1951. (Methuen)

H. Zassenhaus. *The theory of groups.* Translated by S. Kravetz. Pp. viii, 159. \$3.50. 1949. (Chelsea Co., New York)

*Algèbre et théorie des nombres.* Pp. 224. 55s. 1950. Colloques internationaux, 24 (Centre National de la recherche scientifique, Paris ; H. K. Lewis, London)

*Elasticity.* Third symposium in applied mathematics of the American Mathematical Society. Pp. v, 233. 51s. 1951. (McGraw-Hill)

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September, 1951

#### ANNUAL MEETING, 1952.

THE Annual General Meeting of the Association will be held at the Polytechnic, Regent Street, London, W. 1, on Thursday, 3rd January, and Friday, 4th January, 1952.

The President, Dr. Mary L. Cartwright, F.R.S., will give the Presidential Address : " Non-linear Vibrations ; a Recent Chapter in Mathematical History."

There will be a discussion on the principles and policy of the Association's Reports, and an hour of reminiscences to mark the jubilee of the first Teaching Committee.

Friday's business will include a discussion on the recent Calculus Report, and papers on vectors, pure geometry in engineering, and measuring and computing devices of interest to teachers in secondary schools.

#### QUEENSLAND BRANCH

##### REPORT FOR THE YEAR 1950-51.

THIS Branch held its thirtieth Annual Meeting on 18th May, 1951. Since the last Report, the Branch has lost through death one of its early members, Mr. I. Waddle, M.Sc.

The previous Annual Meeting was held at the University on 19th May, 1950. The Annual Report and Statement of Receipts and Expenses for the year were presented to the meeting and were adopted. After the election of officers, Mr. H. M. Finucan read a paper on " Mathematical Psychology " : the usual Presidential Address was not given owing to the absence of the President, Professor Simonds.

Two general meetings have been held at the University during the year. At the first, on 14th August, Mr. E. W. Jones read a paper on " Applications of Curve Properties ", and at the second, on 17th November, Mr. S. G. Brown opened a discussion on the recently issued Report of the Mathematical Association on *The Teaching of Trigonometry in Schools*.

The statement of receipts and expenses for the year shows a credit balance of £20 3s. 6d. The number of members of the Branch is 33, including one life member and 11 members of the Mathematical Association. The *Mathematical Gazette* is circulated among associate members as it comes to hand. The attendance at meetings has been quite good, and the thanks of members are due to those who prepare and read papers at the meetings.

The Officers of the Branch are : *President* : Professor E. F. Simonds ; *Vice-Presidents* : Mr. R. A. Kerr, Mr. E. W. Jones ; *Hon. Secretary and Hon. Treasurer* : Assoc. Professor J. P. McCarthy ; *Members of Committee* : Miss E. H. Raybould, Mr. S. G. Brown, Mr. J. C. Deeney, Mr. P. B. McGovern, Mr. H. M. Finucan.

J. P. McCARTHY, Hon. Secretary.

#### VICTORIA BRANCH.

##### REPORT FOR THE YEAR 1950.

THE number of members of the Branch is 61, of whom 6 are life members, 26 associate members, 4 are institutions, and the others ordinary members.

Five meetings were held during the year :

*May.* Annual Meeting and election of office-bearers. After the formal business, the evening was devoted to a discussion on the teaching of trigonometry, initiated by Messrs. Syer and Clark.

## THE MATHEMATICAL GAZETTE

*July.* Mr. J. A. Macdonald spoke on "Applied Pure Mathematics" and outlined mathematical investigations, originating in problems from widely diverse fields, which he had conducted in connection with his work at Defence Research Laboratories.

*August.* Mr. G. L. White, also of Defence Research Laboratories, spoke on some very interesting and topical applications of the commoner statistical distributions.

*September.* At this meeting the discussion on the teaching of trigonometry was continued in accordance with a resolution passed at the close of the May meeting. Messrs. Syer and Clark concluded their contribution to the discussion and handed over to Messrs. Bowe and Manley.

*November.* Mr. E. H. Palfreyman gave a very instructive address on the mathematics of gambling. This meeting took place in the week preceding that in which the Melbourne Cup was run, and some attention was paid to methods of staking.

J. M. ALLEN, Hon. Secretary.

## BOOKS RECEIVED FOR REVIEW.

H. Beghin et G. Julia. *Exercices de mécanique.* I, 2. 2nd edition. Pp. 339-581. 1951. (Gauthier-Villars)

D. L. Bernstein. *Existence theorems in partial differential equations.* Pp. vii, 228. 16s. 1950. *Annals of Mathematics Studies,* 23. (Princeton University Press; Geoffrey Cumberlege, Oxford University Press)

W. Blaschke. *Kreis und Kugel.* Rep. Pp. x, 169. \$3.50. 1949. (Chelsea Co., New York)

S. Bochner. *Vorlesungen über Fourier'sche Integrale.* Rep. Pp. 229. \$3.95. 1949. (Chelsea Co., New York)

G. Bouligand. *L'accès aux principes de la géométrie euclidienne.* Pp. vii, 88. 320 fr. 1951. (Vuibert, Paris)

N. Bourbaki. *Fonctions d'une variable réelle.* Chs. IV-VIII. Pp. 200. 1951. (Hermann, Paris)

P. Burgatti. *Memorie scelte.* Pp. vi, 354. L. 2500. 1951. (Zanichelli, Bologna)

C. Chevalley. *Introduction to the theory of algebraic functions of one variable.* Pp. xi, 188. \$4. 1951. Mathematical Surveys, 6. (American Mathematical Society, New York)

A. Delachet et J. Taillé. *La ballistique.* Pp. 128. 1951. (Presses Universitaires de France, Paris)

W. J. Dixon and F. J. Massey. *An introduction to statistical analysis.* Pp. x, 370. 38s. 6d. 1951. (McGraw-Hill)

R. Garnier. *Cours de cinématique. III. Géométrie et cinématique cayleyennes.* Pp. xi, 376. 3000 fr. 1951. (Gauthier-Villars)

J. D. N. Gasson. *Mathematics for technical students. I. II.* Pp. xii, 417; x, 431. 15s. each. 1951. (Cambridge University Press)

F. Hausdorff. *Grundzüge der Mengenlehre.* Rep. Pp. viii, 476. \$4.95. 1949. (Chelsea Co., New York)

E. Hecke. *Vorlesungen über die theorie der algebraischen Zahlen.* Rep. Pp. viii, 266. \$3.95. 1948. (Chelsea Co., New York)

P. Hood. *Observing the heavens.* Pp. 64. 5s. 6d. 1951. (Geoffrey Cumberlege, Oxford University Press)

A. V. Howard. *Chambers's dictionary of scientists.* Pp. 250. 12s. 6d. (W. and R Chambers)

E. Kamke. *Differentialgleichungen. Lösungsmethoden und Lösungen.* I. 3rd edition, rep. Pp. xxvi, 666. \$7. 1948. (Chelsea Co., New York)

## BOOKS RECEIVED FOR REVIEW

xi

F. Klein. *Vorlesungen über höhere Geometrie*. 3rd edition, rep. Pp. vi, 405. \$4.95. 1949. (Chelsea Co., New York)

J. F. Koksma. *Diophantische Approximationen*. Rep. Pp. 157. \$3.50. (Chelsea Co., New York)

E. Landau. *Einführung in die elementare und analytische Theorie der algebraischen Zahlen und der Ideale*. 2nd edition, rep. Pp. vii, 147. \$2.95. 1949. (Chelsea Co., New York)

P. Lévy. *Problèmes concrets d'analyse fonctionnelle*. 2nd edition of *Leçons d'analyse fonctionnelle*. Pp. xiv, 484. 4000 fr. 1951. (Gauthier-Villars)

E. A. Maxwell. *General homogeneous coordinates in space of three dimensions*. Pp. xix, 169. 15s. 1951. (Cambridge University Press)

L. M. Milne-Thomson. *Jacobian elliptic function tables*. New edition. Pp. xi, 123. \$2.45. 1951. (Dover Publications, New York)

R. von Mises. *Wahrscheinlichkeit, Statistik und Wahrheit*. 3rd edition. Pp. ix, 278. 31s. 1951. (Springer, Vienna)

E. H. Neville. *Jacobian elliptic functions*. 2nd edition. Pp. xvi, 345. 30s. 1951. (Geoffrey Cumberlege, Oxford University Press)

A. Ostrowski. *Vorlesungen über Differential- und Integralrechnung. II*. Pp. 482. Sw. fr. 63; geb. Sw. fr. 67. 1951. (Birkhäuser, Basel)

O. Perron. *Die Lehre von den Kettenbrüchen*. 2nd edition, rep. Pp. xii, 524. \$5.50. 1950. (Chelsea Co., New York)

P. Rosenbloom. *The elements of mathematical logic*. Pp. iv, 214. \$2.95. 1951. (Dover Publications, New York)

J. B. Scarborough. *Numerical mathematical analysis*. 2nd edition. Pp. xviii, 511. 48s. 1950. (Johns Hopkins Press; Geoffrey Cumberlege, Oxford University Press)

B. Segre. *Arithmetical questions on algebraic varieties*. Pp. 55. 10s. 6d. 1951. (University of London Athlone Press)

E. C. Titchmarsh. *The theory of the Riemann zeta-function*. Pp. 346. 40s. 1951. (Geoffrey Cumberlege, Oxford University Press)

C. J. Tranter. *Integral transforms in mathematical physics*. Pp. ix, 118. 6s. 1951. (Methuen)

C. O. Tuckey. *Basic trigonometry*. Pp. ix, 204. 6s. 6d.; with answers, 7s. 6d. 1951. (Christophers)

G. Verriest. *Introduction à la géométrie non-euclidienne par la méthode élémentaire*. Pp. vii, 192. 1000 fr. 1951. (Gauthier-Villars)

H. Weyl. *Die Idee der Riemannschen Fläche*. Rep. Pp. viii, 183. \$3.50. 1951. (Chelsea Co., New York)

*Contributions to the theory of games*. Edited by H. W. Kuhn and A. W. Tucker. Pp. xv, 201. 20s. 1950. *Annals of Mathematics Studies*, 24. (Princeton University Press; Geoffrey Cumberlege, Oxford University Press)

*Professional opportunities in mathematics*. A report prepared by a committee of the Mathematical Association of America. Pp. 24. 25c. 1951. (H. M. Gehman, University of Buffalo, Buffalo 14, N.Y.)

L. Kollros : *Jakob Steiner*. R. Fueter : *Leonhard Euler*. J. J. Burckhardt : *Ludwig Schläfli*. E. Voellmy : *Jost Bürgi und die Logarithmen*. J. O. Fleckenstein : *Johann und Jakob Bernoulli*. L. Kollros : *Évariste Galois*. O. Ore : *Niels Henrik Abel*. R. Taton : *Gaspard Monge*. J. Itard : *Pierre Fermat*. L. v. Dávid : *Die beiden Bolyai*. 24 pp. each. Sw. fr. 3.50 each. Beihefte zu *Elemente der Mathematik*, Nos. 2-11, 1947-1951 (Birkhäuser, Basel).

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